

NWEA Research Report Study of Growth Index Performance by School

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Background

The central mission of schools is to help nurture growth in children. Northwest Evaluation Association assists in this mission by developing assessments that are useful for measuring growth in the core academic subjects. NWEA has pioneered the use of growth-based measures by publishing the first national norms for student growth. The most recent version of the norms (2005) includes test records from more than 2,300,000 students nationwide.

As we have gained experience with growth measures, our tools for assessing and reporting growth have improved in nuance and sophistication. One innovation is the introduction of the **growth index** score, which uses the norms to compare a student's growth to students nationally in the same grade who started with the same RIT score. Assume, for example, that Marco is a 5th grader this spring. He achieved a RIT score of 225 on his most recent NWEA math test. The previous spring, Marco scored 210 as a 4th grader. Because NWEA measures math achievement on a single cross-grade equal interval scale, we can say that Marco grew 15 points during the past year. But is 15 points of growth good? Substandard? Clearly some basis for comparison is needed.

According to the most recent norms study, 4th graders who started with a score of 210 in mathematics, like Marco, grew an average of about 9 points (actually 9.05 points rounded) from spring to spring. We call this number the **RIT point growth norm** for Marco. Since Marco grew 15 points, we calculate his **growth index** score by subtracting the RIT point growth norm from his actual growth (15-9). This makes Marcos **growth index** score a +6. This statistic tells us that Marco did quite well when we compare his growth to a group of similarly performing peers. If another student in this class, say Jake, started with the same score of 210 and improved to only 215, his growth index score would be calculated by subtracting the 9 point growth of the norm group from his growth, 5 points. This gives Jake a **growth index** score of -3, indicating that Jake's growth was slightly lower than his peer group.

The **growth index** score is a useful statistic for evaluating the progress of students and growth produced by schools. First, the use of a growth statistic by itself provides a direct assessment of academic progress, and progress is the primary academic variable that educators attempt to influence. In addition, the use of growth measures diminishes the effect that factors external to schools, such as socio-economic factors, typically introduce into the assessment of student performance on achievement tests. Finally, use of the growth index controls for starting achievement on the RIT scale. Introducing this control is quite reasonable. If we were trying to assess the effectiveness of various weight loss programs for example, we would not evaluate the effectiveness of a program for a person who is more than 100 pounds overweight by comparing his or her weight loss to the weight loss enjoyed by a population that averaged only 10 pounds overweight. We would want to compare this individual's progress to a group of obese people. Similarly, if we are judging the progress of students, we should compare the progress of high performers to other high performers and low performers to others students of similar standing. This improves the fairness of comparisons and provides a reasonable estimate of the "value-added" a school program might provide.

Since the publication of the first RIT-based growth norms in 2000, many NWEA clients have begun using some variant of the growth index concept as a tool to assess the growth produced by schools and programs. The growth index statistic, however, lacked any basis for formulating comparisons that would allow users to draw sound judgments from their data. For example, if the 4th graders at Shady Elm elementary produced an average growth index score of +3, we had no way to determine just how strong their performance was without some knowledge of the growth index scores produced by other schools. In an effort to identify some parameters for this statistic we conducted a study of growth index scores produced by schools that participated in the 2002 norming study (Cronin, 2003). This study uses the 2005 norms to expand the scope of this work to a much larger and more stable population of schools.

Methodology

Fall-to-spring, spring-to-spring, and fall-to-fall growth index averages in reading, language usage, and mathematics were generated for all schools participating in the 2005 norms study who tested more than 20 students in a grade.

To calculate the averages, individual growth index statistics were calculated for all students who had valid test scores for both seasons covered by the study. Student scores were screened using the same minimum score, maximum score, and standard error criteria that NWEA normally uses to assess the validity of a test score. Scores that did not survive these screening criteria were removed.

School-wide averages were calculated by grade using the growth index scores of students whose results survived application of the criteria. These averages were used to calculate univariate summaries of the school growth index averages and place them within percentile tables.

Some schools prefer to generate counts of the proportion of students who were successful at meeting or exceeding their growth index target. Based on data from the norms study, we also calculated the proportion of students in each participating grade within each school who were successful at meeting or exceeding their growth index target. These results were also placed within percentile tables.

When schools evaluate their results against that achieved by other schools they should be aware that a growth index score of 0.0 does not always represent the mid-point of a distribution.

Interpreting the Results

Tables 2 through 19 (pp. 7-12) display the results of the study. Schools typically use growth index results for two purposes:

1. To identify whether a school program is producing value-added results for students on the NWEA measure.
2. To establish numerical targets for school or program improvement.

Evaluating whether a school program produces value-added results

Let's assume we are evaluating a seventh grade reading program at Logan Middle School. Their program produced a spring to spring growth index score of +1.7 this past year and 60% of their students were successful in achieving growth equal to or exceeding their RIT range growth norm. Did this program produce value-added results?

According to Table 1, Logan's growth index score exceeded that of more than 90% of the schools participating in the norm study. The proportion of students who met or exceeded their growth norm, 60%, also exceeded that of 80% of the schools in the norm study. Both statistics are more than 1 standard deviation beyond the mean scores for this grade. You could fairly say that this school did produce value-added results.

Now assume that a second school, Mellon Elementary, produced a growth index score of -2.0 and that only 37% of their students were successful in achieving their RIT range growth norm. Would that result be cause for concern? Mellon's growth index scores are below those of 80% of the schools participating in the norm study, and it is more than one standard deviation from the median school in the group. In addition, the proportion of students who met their growth norm, 37%, is lower than 90% of schools and is more than a standard deviation below the mean. It would be fair to say that Mellon's results are poor enough that they should merit concern.

Table 1 – Example of spring grade 6 to spring grade 7 school growth index results for reading

Grade 6-7 Percentile	Growth Index	Proportion Meeting RIT Range Growth Norm
1	-6.5	24.58%
5	-4.0	33.33%
10	-3.0	37.72%
20	-2.0	41.83%
30	-1.4	46.03%
40	-0.8	48.97%
50	-0.4	51.55%
60	0.0	54.61%
70	0.5	56.94%
80	1.0	59.98%
90	1.7	65.30%
95	2.4	71.30%
99	3.7	75.13%
Summary		
Count	550	550
Mean	-0.553	51.38%
Standard Deviation	2.01	10.90%
Legend		
Logan		
Mellon		

Establishing targets for school improvement

What might be a reasonable improvement target for a school like Mellon Elementary?

A good target should be achievable if teachers apply strong, focused effort toward improvements that are well designed and research-based. The target should be difficult to achieve purely by accident. The percentile tables help educators judge the reasonability of a target by providing data about what other schools have successfully achieved.

Let's say Mellon tries for a 0.5 point improvement, this would move their average from a growth index of -2.0 to an index of -1.5 . More than 70% of schools already meet or exceed this growth index score. The anticipated improvement is about one-fourth of a standard deviation, and would move Mellon's performance past only about 10% of the schools in the norm study. This target doesn't seem adequately ambitious. If achieved, students would still be losing ground relative to their peers, and it would not represent a large enough improvement in performance to be confident that it was not merely a product of chance.

A $+3.0$ growth index score improvement would clearly be more ambitious. It would put Mellon's growth index statistic beyond 80% of the schools that participated in the norm study and would be an improvement of about 1.5 standard deviations. But this level of growth, while it is achieved by one-fifth of all schools, may seem like more than a school can achieve in a single year (although this is entirely a matter of judgment). One would applaud this school if they tackled this kind of target, but would not fault them if they concluded it is too ambitious to be achieved in a single year.

An improvement of $+2.0$ points seems more reasonable. It would move Mellon to the overall average and would represent a change of one standard deviation change. This kind of improvement is not likely to be achieved without effort, but it seems achievable if the staff acts strongly and purposefully. And it represents growth that is already achieved by half of schools. How far Mellon's staff wishes to stretch, however, should be their choice after informed deliberation.

One would apply the same principles when using the statistics showing proportions of students meeting or exceeding our RIT range growth norms. In both cases, a good target should be within the realm of the possible (at least somewhere inside the table, probably between the 10th and 90th percentile), it should require more improvement than would normally be achieved by random variance, and it should require strong, purposeful action on the part of the faculty to achieve.

Table 2 – School percentile ranks for fall to spring school program growth index averages – reading

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	-8.4	-7.8	-6.9	-6.1	-6.4	-6.8	-6.7	-8.3	-6.9
5	-5.1	-5.0	-4.2	-3.5	-3.7	-4.0	-3.5	-4.5	-5.4
10	-3.7	-3.7	-3.1	-2.5	-2.7	-3.0	-2.8	-3.5	-4.1
20	-2.0	-2.2	-1.8	-1.5	-1.7	-2.0	-1.9	-2.2	-3.1
30	-1.0	-1.3	-1.0	-0.9	-1.2	-1.4	-1.4	-1.8	-2.5
40	-0.1	-0.5	-0.4	-0.4	-0.7	-0.9	-0.9	-1.4	-2.1
50	0.5	0.2	0.1	0.1	-0.1	-0.4	-0.5	-1.0	-1.6
60	1.2	0.8	0.6	0.6	0.3	0.0	-0.1	-0.6	-1.1
70	2.0	1.4	1.1	1.1	0.8	0.4	0.3	-0.2	-0.6
80	2.7	2.2	1.7	1.6	1.4	0.9	0.7	0.2	0.1
90	4.0	3.0	2.6	2.4	2.2	1.9	1.6	1.0	1.6
95	4.9	3.8	3.3	3.2	2.7	2.4	2.3	1.5	2.5
99	6.5	5.5	4.8	4.9	4.4	3.7	3.6	3.1	5.5
Summary Information									
Count	879	1387	1375	1521	1002	598	550	430	183
Mean	0.276	-0.108	-0.101	0.011	-0.251	-0.538	-0.653	-1.179	-1.467
SD	3.14	2.71	2.32	2.10	2.01	1.98	1.98	1.98	2.28

Table 3 – School percentile ranks for spring to spring school growth index averages – reading

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-6.9	-5.6	-5.8	-5.9	-6.5	-7.3	-7.0	-7.4
5	-4.5	-3.6	-3.6	-3.5	-4.0	-3.7	-5.2	-6.0
10	-3.2	-2.8	-2.6	-2.3	-3.0	-2.8	-4.3	-4.3
20	-2.0	-1.6	-1.7	-1.3	-2.0	-1.8	-3.1	-2.9
30	-1.3	-0.9	-1.1	-0.7	-1.4	-1.1	-2.6	-1.8
40	-0.6	-0.4	-0.6	-0.2	-0.8	-0.8	-1.7	-1.2
50	0.0	0.1	-0.1	0.3	-0.4	-0.4	-1.2	-0.7
60	0.6	0.6	0.3	0.7	0.0	0.0	-0.7	-0.4
70	1.1	1.0	0.8	1.2	0.5	0.5	-0.3	0.0
80	1.8	1.6	1.3	1.8	1.0	0.8	0.1	0.5
90	2.9	2.3	2.0	2.6	1.7	1.6	0.9	1.3
95	3.8	2.8	2.9	3.4	2.4	2.3	2.0	2.2
99	5.4	4.4	4.4	4.6	3.7	3.2	4.4	4.5
Summary Information								
Count	952	1278	1285	952	550	480	264	117
Mean	-0.128	-0.068	-0.216	0.167	-0.553	-0.558	-1.425	-1.149
SD	2.52	2.04	1.97	2.05	2.01	1.92	2.14	2.25

Table 4 – School Percentile ranks for fall to fall school growth index averages – reading

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-7.0	-7.9	-5.7	-5.7	-5.6	-5.6	-6.9	-7.3
5	-4.4	-4.4	-3.6	-3.6	-3.9	-3.3	-4.3	-4.5
10	-3.0	-3.0	-2.6	-2.3	-2.9	-2.4	-3.2	-3.8
20	-1.7	-1.8	-1.6	-1.4	-1.8	-1.4	-2.1	-2.6
30	-0.9	-1.1	-1.0	-0.8	-1.1	-0.9	-1.4	-1.8
40	-0.2	-0.4	-0.5	-0.3	-0.5	-0.5	-0.7	-1.0
50	0.3	0.2	0.0	0.3	-0.1	0.0	-0.3	-0.6
60	0.8	0.6	0.4	0.7	0.3	0.4	0.1	-0.1
70	1.4	1.1	0.9	1.1	0.8	0.8	0.6	0.3
80	2.1	1.7	1.5	1.7	1.2	1.3	1.1	0.7
90	3.1	2.6	2.3	2.5	1.9	2.0	1.7	1.4
95	4.0	3.3	2.9	3.2	2.5	2.6	2.6	1.9
99	5.5	4.4	4.1	4.6	4.3	4.2	4.0	3.0
Summary Information								
Count	849	1488	1439	929	654	615	406	274
Mean	0.099	-0.145	-0.140	0.115	-0.306	-0.128	-0.515	-0.932
SD	2.50	2.40	1.96	1.99	1.95	1.85	2.05	2.09

Table 5– School percentile ranks for fall to spring percentage of students meeting or exceeding their RIT point growth target – reading

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	18.4%	16.5%	19.0%	23.1%	22.8%	25.9%	21.6%	19.0%	20.7%
5	29.9%	26.7%	30.6%	32.6%	31.8%	34.2%	33.0%	30.9%	27.1%
10	36.2%	34.0%	36.0%	38.2%	39.0%	37.5%	38.5%	36.5%	33.0%
20	44.1%	41.5%	43.1%	44.4%	43.6%	43.0%	42.6%	40.7%	36.4%
30	48.8%	46.5%	47.6%	48.0%	46.9%	46.1%	45.6%	43.4%	39.2%
40	53.0%	51.2%	50.8%	51.3%	50.0%	48.4%	48.2%	45.8%	41.6%
50	56.7%	54.9%	54.2%	54.2%	53.6%	51.1%	50.0%	47.7%	44.6%
60	60.7%	58.1%	57.6%	57.1%	56.2%	53.6%	52.5%	49.7%	47.3%
70	64.4%	62.4%	60.9%	60.0%	59.2%	56.4%	55.1%	52.2%	51.6%
80	69.5%	66.7%	64.9%	64.1%	62.4%	59.1%	58.2%	55.5%	56.4%
90	74.5%	72.2%	70.0%	69.4%	67.1%	63.9%	62.8%	60.2%	61.5%
95	79.6%	76.0%	73.9%	74.0%	70.5%	68.7%	66.5%	63.9%	66.7%
99	87.6%	84.9%	82.7%	82.6%	79.7%	77.8%	76.4%	69.0%	80.3%
Summary Information									
Count	879	1387	1375	1521	1002	598	550	430	183
Mean	56.07%	53.79%	53.63%	54.02%	52.78%	51.14%	50.32%	47.77%	45.79%
SD	15.00%	14.80%	13.15%	12.38%	11.47%	10.49%	10.35%	9.71%	11.65%

Table 6 – School percentile ranks for spring to spring percentage of students meeting or exceeding their RIT point growth target – reading

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	17.9%	26.6%	22.4%	25.4%	24.6%	23.7%	20.9%	20.2%
5	31.1%	34.2%	32.6%	36.6%	33.3%	33.4%	29.0%	28.5%
10	35.9%	37.9%	37.4%	41.1%	37.7%	38.3%	33.8%	30.6%
20	42.4%	44.2%	43.2%	46.3%	41.8%	43.2%	37.8%	37.7%
30	47.2%	48.3%	47.3%	50.0%	46.0%	46.4%	40.7%	44.7%
40	50.6%	51.5%	50.0%	52.6%	49.0%	49.3%	43.3%	46.5%
50	53.8%	54.1%	53.1%	55.7%	51.5%	51.3%	47.3%	50.0%
60	57.5%	57.1%	56.1%	58.4%	54.6%	53.6%	50.0%	52.0%
70	61.2%	60.0%	59.5%	61.7%	56.9%	56.2%	52.3%	53.5%
80	65.0%	64.5%	63.1%	65.6%	60.0%	59.3%	55.3%	57.2%
90	70.0%	69.2%	67.5%	70.3%	65.3%	63.1%	60.0%	61.6%
95	75.0%	72.4%	72.0%	74.6%	71.3%	66.2%	64.4%	65.4%
99	83.0%	79.7%	80.6%	82.3%	75.1%	74.2%	76.9%	70.9%
Summary Information								
Count	952	1278	1285	952	550	480	264	117
Mean	53.68%	53.99%	52.98%	55.64%	51.38%	51.01%	46.72%	48.16%
SD	13.49%	11.76%	12.02%	11.60%	10.90%	10.02%	10.71%	10.98%

Table 7 – School percentile ranks for fall to fall percentage of students meeting or exceeding their RIT point growth target – reading

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	19.4%	20.8%	24.0%	28.1%	26.6%	26.7%	25.5%	22.5%
5	33.3%	32.0%	34.2%	36.8%	34.3%	37.4%	32.0%	32.4%
10	38.0%	37.5%	39.7%	40.7%	38.1%	40.9%	37.9%	35.5%
20	44.9%	44.2%	45.0%	45.7%	44.3%	45.6%	43.0%	41.0%
30	49.1%	48.7%	48.4%	50.0%	48.6%	48.5%	46.5%	44.4%
40	52.6%	52.2%	51.6%	52.9%	51.4%	51.6%	49.7%	46.8%
50	55.3%	54.9%	54.5%	55.6%	53.6%	53.7%	52.8%	50.4%
60	57.7%	58.1%	57.1%	58.1%	55.9%	56.7%	55.2%	52.9%
70	61.5%	60.9%	60.0%	60.7%	58.8%	58.9%	57.3%	54.9%
80	65.4%	64.5%	63.3%	64.9%	61.5%	61.9%	60.3%	56.7%
90	70.2%	68.6%	68.2%	68.9%	65.3%	65.8%	65.3%	60.5%
95	72.8%	72.5%	71.6%	72.8%	68.6%	70.7%	69.1%	63.8%
99	80.2%	78.8%	78.8%	80.9%	75.0%	76.6%	76.1%	73.6%
Summary Information								
Count	849	1488	1439	929	654	615	406	274
Mean	54.64%	54.08%	54.04%	55.15%	52.96%	53.67%	51.80%	49.05%
SD	12.49%	12.25%	11.13%	11.14%	10.42%	9.95%	10.79%	10.11%

Table 8 – School percentile ranks for fall to spring school program growth index averages – language usage

	Percentile Table								
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	-7.2	-7.4	-5.6	-5.3	-5.5	-5.9	-4.9	-6.2	-4.7
5	-4.2	-4.6	-3.9	-3.3	-3.2	-3.6	-3.0	-3.7	-3.8
10	-3.0	-3.5	-2.6	-2.3	-2.2	-2.7	-2.5	-2.7	-2.9
20	-1.7	-2.2	-1.5	-1.4	-1.3	-1.9	-1.6	-2.3	-2.5
30	-0.8	-1.2	-0.7	-0.8	-0.8	-1.2	-1.2	-1.8	-2.2
40	-0.1	-0.4	-0.2	-0.3	-0.3	-0.8	-0.8	-1.4	-1.9
50	0.6	0.2	0.3	0.1	0.1	-0.4	-0.4	-1.1	-1.4
60	1.3	0.8	0.8	0.5	0.5	0.0	-0.1	-0.8	-1.1
70	2.0	1.4	1.3	1.0	0.9	0.3	0.3	-0.5	-0.6
80	2.8	2.3	2.0	1.5	1.4	0.8	0.7	-0.1	-0.1
90	4.1	3.2	2.8	2.3	2.2	1.6	1.3	0.6	0.7
95	5.2	3.8	3.5	2.9	2.8	2.2	1.5	1.4	1.4
99	7.1	5.6	5.2	4.1	4.2	3.3	2.6	2.3	3.8
Summary Information									
Count	687	1041	1041	1197	788	452	412	357	147
Mean	0.526	-0.013	0.203	-0.009	-0.006	-0.520	-0.554	-1.161	-1.288
SD	2.84	2.64	2.17	1.90	1.83	1.75	1.52	1.51	1.53

Table 9 – School percentile ranks for spring to spring school growth index averages – language usage

	Percentile Table							
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-7.0	-5.7	-5.7	-6.2	-6.3	-5.5	-5.2	-6.0
5	-4.1	-3.7	-3.1	-3.2	-4.1	-3.1	-4.3	-4.1
10	-3.0	-2.8	-2.5	-2.0	-2.8	-2.5	-3.5	-3.5
20	-1.8	-1.6	-1.7	-1.2	-2.0	-1.4	-2.8	-2.5
30	-1.1	-0.9	-1.0	-0.6	-1.3	-1.0	-2.0	-2.0
40	-0.5	-0.4	-0.5	-0.1	-0.7	-0.6	-1.6	-1.6
50	0.1	0.1	-0.1	0.4	-0.3	-0.3	-1.1	-0.8
60	0.7	0.5	0.4	0.8	0.1	0.0	-0.8	-0.7
70	1.2	1.0	0.9	1.3	0.6	0.3	-0.5	-0.2
80	1.9	1.6	1.5	1.8	1.0	0.6	0.3	0.4
90	3.1	2.3	2.3	2.6	1.6	1.3	1.2	1.1
95	3.9	2.9	3.0	3.2	2.3	1.5	1.6	2.0
99	4.9	4.4	4.2	5.0	3.3	2.4	3.5	2.7
Summary Information								
Count	671	881	876	710	372	354	191	87
Mean	-0.026	-0.079	-0.137	0.252	-0.494	-0.493	-1.184	-1.126
SD	2.48	2.02	1.97	2.05	1.92	1.50	1.74	1.77

Table 10 – School percentile ranks for fall to fall school growth index averages – language usage

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-7.0	-5.9	-5.0	-4.4	-4.7	-3.9	-5.4	-5.2
5	-4.3	-3.9	-3.0	-2.6	-2.7	-2.6	-3.3	-3.5
10	-3.2	-3.0	-2.3	-2.0	-2.0	-1.9	-2.5	-2.8
20	-1.8	-1.7	-1.3	-1.1	-1.3	-1.4	-1.6	-2.0
30	-1.0	-0.8	-0.6	-0.6	-0.9	-0.8	-1.2	-1.4
40	-0.4	-0.2	-0.2	-0.2	-0.4	-0.4	-0.8	-0.9
50	0.2	0.3	0.3	0.3	-0.1	-0.1	-0.4	-0.5
60	0.7	0.7	0.7	0.6	0.2	0.2	0.0	-0.4
70	1.3	1.2	1.1	1.0	0.6	0.6	0.4	-0.1
80	2.0	1.7	1.6	1.4	1.0	1.0	0.7	0.3
90	3.0	2.6	2.3	2.2	1.8	1.7	1.3	0.9
95	3.8	3.1	3.0	2.7	2.4	2.0	2.0	1.4
99	5.5	4.5	4.5	4.3	3.4	3.1	3.3	2.7
Summary Information								
Count	675	1137	1101	710	500	475	317	233
Mean	0.035	0.017	0.126	0.156	-0.155	-0.169	-0.472	-0.805
SD	2.44	2.20	1.87	1.70	1.58	1.49	1.57	1.46

Table 11 – School percentile ranks for fall to spring percentage of students meeting or exceeding their RIT point growth target – language usage

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	19.5%	19.0%	22.4%	21.5%	22.9%	20.0%	28.1%	25.6%	24.0%
5	32.5%	28.8%	32.6%	33.3%	34.4%	33.7%	33.3%	30.8%	31.7%
10	38.8%	34.9%	38.0%	37.6%	39.6%	37.5%	38.5%	34.4%	34.7%
20	45.5%	42.1%	45.1%	44.7%	43.9%	42.4%	43.5%	38.6%	38.0%
30	50.7%	47.8%	49.5%	48.4%	48.9%	45.9%	46.6%	41.6%	40.6%
40	55.0%	51.6%	53.2%	51.7%	51.9%	48.9%	49.5%	44.1%	42.6%
50	59.0%	55.7%	56.7%	54.9%	55.2%	52.5%	51.0%	46.1%	45.2%
60	62.5%	60.0%	60.0%	57.9%	57.8%	55.0%	54.1%	48.3%	46.9%
70	66.7%	63.6%	63.6%	61.5%	60.6%	57.0%	56.5%	50.3%	50.0%
80	70.5%	67.9%	67.7%	65.1%	64.5%	60.2%	59.9%	53.2%	54.3%
90	76.3%	73.7%	73.4%	70.3%	70.0%	64.9%	63.8%	57.8%	57.9%
95	80.6%	78.3%	77.5%	73.9%	73.7%	69.6%	67.2%	62.2%	65.6%
99	90.0%	84.2%	85.0%	81.8%	82.9%	78.3%	73.7%	69.2%	86.2%
Summary Information									
Count	687	1041	1041	1197	788	452	412	357	147
Mean	57.98%	54.90%	56.02%	54.47%	54.56%	51.48%	51.29%	46.15%	46.12%
SD	14.73%	14.85%	13.68%	12.61%	12.00%	11.09%	9.92%	9.14%	10.36%

Table 12 – School percentile ranks for spring to spring percentage of students meeting or exceeding their RIT point growth target – language usage

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	24.7%	24.9%	23.3%	25.0%	25.6%	24.3%	20.5%	19.2%
5	33.0%	34.3%	34.8%	35.4%	31.7%	35.8%	31.0%	29.6%
10	37.2%	38.8%	39.3%	41.4%	36.2%	39.0%	34.0%	31.9%
20	43.5%	45.1%	44.1%	46.9%	42.4%	44.7%	38.3%	37.0%
30	48.4%	48.8%	47.4%	51.3%	46.0%	47.5%	40.5%	42.7%
40	51.6%	52.0%	50.9%	54.1%	49.8%	50.0%	43.5%	45.1%
50	55.6%	55.0%	54.5%	57.1%	52.6%	51.5%	46.2%	48.0%
60	58.3%	58.4%	57.7%	60.3%	55.4%	54.3%	48.0%	51.8%
70	62.4%	61.8%	60.8%	63.3%	58.6%	56.4%	51.3%	53.1%
80	66.5%	65.7%	64.9%	67.2%	61.1%	60.2%	57.2%	56.4%
90	71.8%	69.5%	69.8%	72.2%	65.0%	63.5%	61.9%	60.3%
95	76.0%	74.5%	75.0%	76.9%	69.9%	66.2%	66.4%	67.6%
99	85.2%	82.5%	81.8%	83.1%	77.8%	71.4%	80.5%	80.0%
Summary Information								
Count	671	881	876	710	372	354	191	87
Mean	54.95%	54.94%	54.30%	56.79%	51.90%	51.65%	47.01%	47.59%
SD	13.32%	12.18%	12.36%	12.43%	11.39%	9.50%	10.92%	11.30%

Table 13 – School percentile ranks for fall to fall percentage of students meeting or exceeding their RIT point growth target – language usage

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	22.4%	26.1%	28.2%	27.7%	29.2%	30.3%	23.3%	27.1%
5	33.3%	33.3%	36.8%	37.1%	38.1%	38.3%	36.0%	31.8%
10	37.7%	38.2%	41.4%	40.9%	42.1%	42.4%	40.3%	35.2%
20	44.7%	45.0%	46.4%	47.4%	46.2%	46.5%	43.8%	40.9%
30	48.7%	48.9%	50.0%	50.8%	49.4%	48.9%	46.5%	44.1%
40	52.8%	53.2%	53.7%	53.4%	52.1%	51.5%	49.4%	47.6%
50	56.6%	56.5%	56.1%	55.8%	54.7%	53.6%	51.9%	49.7%
60	59.5%	59.2%	58.9%	58.8%	57.0%	55.9%	55.2%	51.6%
70	63.0%	61.8%	62.2%	61.5%	59.1%	59.0%	57.3%	53.8%
80	67.4%	65.6%	65.8%	64.9%	62.0%	61.7%	60.1%	56.0%
90	72.8%	71.1%	70.0%	69.8%	67.0%	65.3%	64.3%	60.0%
95	76.9%	74.5%	74.3%	74.0%	70.9%	69.8%	66.7%	63.5%
99	84.2%	82.6%	82.2%	81.0%	77.8%	76.7%	74.8%	75.5%
Summary Information								
Count	675	1137	1101	710	500	475	317	233
Mean	55.78%	55.28%	56.06%	55.88%	54.38%	53.88%	51.85%	48.79%
SD	13.22%	12.43%	11.35%	10.97%	9.89%	9.62%	9.73%	9.51%

Table 14 – School percentile ranks for fall to spring school program growth index averages – mathematics

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	-7.0	-7.1	-6.1	-6.6	-6.5	-5.6	-5.8	-6.8	-5.1
5	-4.8	-5.0	-4.3	-4.6	-3.8	-4.0	-3.9	-4.0	-4.1
10	-3.6	-3.8	-3.3	-3.6	-3.1	-3.2	-3.2	-3.1	-3.4
20	-2.3	-2.5	-2.2	-2.2	-2.0	-1.9	-2.0	-2.2	-2.6
30	-1.3	-1.7	-1.4	-1.4	-1.2	-1.2	-1.4	-1.5	-1.9
40	-0.6	-0.9	-0.7	-0.7	-0.6	-0.6	-0.8	-0.8	-1.2
50	0.1	-0.2	-0.1	-0.1	0.1	-0.2	-0.3	-0.3	-0.8
60	1.0	0.6	0.6	0.6	0.8	0.4	0.2	0.3	-0.1
70	1.7	1.3	1.3	1.3	1.6	1.0	0.8	0.8	0.6
80	2.7	2.3	2.3	2.2	2.7	1.7	1.4	1.8	1.9
90	4.1	3.4	3.5	3.3	4.1	2.8	2.1	2.7	2.9
95	5.2	4.3	4.4	4.2	5.2	3.7	3.0	3.7	4.3
99	7.3	6.1	6.0	5.7	7.1	5.8	4.6	5.6	7.4
Summary Information									
Count	902	1445	1425	1581	1016	602	555	419	186
Mean	0.218	-0.221	-0.001	-0.099	0.272	-0.158	-0.348	-0.221	-0.391
SD	3.01	2.82	2.63	2.70	2.87	2.34	2.11	2.49	2.60

Table 15 – School percentile ranks for spring to spring school growth index averages – mathematics

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-7.8	-6.6	-6.8	-7.3	-6.4	-6.4	-8.2	-10.5
5	-5.3	-4.8	-4.4	-4.2	-4.2	-4.7	-5.8	-5.5
10	-4.2	-3.6	-3.5	-3.3	-3.3	-3.6	-4.7	-4.4
20	-2.8	-2.4	-2.5	-2.0	-2.0	-2.6	-3.8	-3.2
30	-1.9	-1.7	-1.5	-1.0	-1.1	-1.9	-2.8	-1.9
40	-1.1	-0.9	-0.9	-0.1	-0.5	-1.3	-2.0	-1.1
50	-0.6	-0.2	-0.3	0.6	0.1	-0.8	-1.5	-0.5
60	0.1	0.4	0.4	1.4	0.6	-0.3	-0.8	0.0
70	1.0	1.1	1.0	2.3	1.1	0.3	0.1	0.4
80	1.9	2.0	1.7	3.4	1.7	0.9	1.4	1.0
90	3.2	2.9	2.8	5.2	2.7	1.8	2.9	2.9
95	4.2	3.9	3.8	6.7	3.5	2.9	4.1	5.5
99	6.4	5.6	5.7	9.3	6.3	5.8	6.2	7.3
Summary Information								
Count	947	1297	1309	960	557	487	279	130
Mean	-0.494	-0.294	-0.329	0.774	-0.093	-0.799	-1.189	-0.734
SD	2.93	2.61	2.53	3.32	2.43	2.32	2.97	3.03

Table 16 – School percentile ranks for fall to fall school growth index averages – mathematics

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-6.2	-6.2	-5.5	-6.3	-5.9	-4.9	-6.4	-6.1
5	-3.9	-3.9	-3.4	-4.2	-3.9	-3.3	-4.2	-4.2
10	-2.7	-2.8	-2.6	-2.9	-2.9	-2.5	-3.1	-3.6
20	-1.7	-1.7	-1.6	-1.7	-1.8	-1.6	-1.8	-2.4
30	-0.9	-1.0	-1.0	-0.9	-1.2	-1.0	-1.2	-1.7
40	-0.3	-0.5	-0.4	-0.2	-0.7	-0.5	-0.6	-1.2
50	0.2	0.1	0.1	0.4	-0.2	0.0	-0.1	-0.5
60	0.9	0.7	0.5	1.0	0.3	0.5	0.4	0.1
70	1.4	1.3	1.1	1.7	1.0	1.0	1.2	0.7
80	2.2	1.8	1.7	2.3	1.7	1.5	1.9	1.5
90	3.2	2.8	2.6	3.4	2.7	2.5	2.6	2.5
95	4.2	3.4	3.3	4.2	3.4	3.0	3.4	3.1
99	6.3	5.1	5.2	5.8	5.3	5.5	4.8	5.3
Summary Information								
Count	879	1543	1485	942	647	614	395	278
Mean	0.245	-0.002	0.029	0.305	-0.144	-0.007	-0.133	-0.516
SD	2.44	2.30	2.06	2.49	2.22	1.98	2.30	2.32

Table 17 – School percentile ranks for fall to spring percentage of students meeting or exceeding their RIT point growth target – mathematics

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	12.8%	13.7%	16.6%	16.7%	13.7%	19.1%	21.4%	23.5%	25.4%
5	24.3%	25.0%	27.5%	25.8%	29.3%	31.1%	31.2%	35.7%	32.6%
10	31.6%	29.8%	32.3%	31.7%	34.5%	35.4%	34.7%	38.1%	34.3%
20	40.5%	37.0%	39.2%	39.1%	40.9%	42.2%	41.3%	41.9%	40.0%
30	46.0%	42.6%	44.4%	44.6%	45.8%	46.1%	45.2%	45.8%	43.6%
40	51.4%	48.4%	48.4%	48.8%	50.4%	49.7%	48.7%	49.3%	47.8%
50	55.3%	52.8%	52.8%	52.9%	54.0%	52.3%	51.8%	52.3%	50.0%
60	60.0%	57.1%	56.9%	57.1%	57.6%	56.0%	55.0%	56.1%	52.7%
70	64.7%	62.2%	61.5%	61.5%	61.9%	59.2%	58.5%	59.6%	57.6%
80	70.6%	67.6%	66.7%	66.7%	68.4%	63.6%	61.5%	64.8%	65.2%
90	78.1%	73.9%	73.4%	72.5%	76.7%	68.7%	66.9%	70.4%	73.5%
95	83.3%	78.9%	78.5%	77.1%	81.5%	73.4%	71.1%	75.1%	78.8%
99	91.0%	86.5%	88.5%	86.2%	88.9%	83.3%	78.0%	84.8%	92.4%
Summary Information									
Count	902	1445	1425	1581	1016	602	555	419	186
Mean	55.13%	52.27%	52.85%	52.61%	54.47%	52.50%	51.47%	53.38%	52.16%
SD	17.38%	16.78%	15.68%	15.63%	15.96%	13.18%	12.31%	12.68%	14.42%

Table 18 – School percentile ranks for spring to spring percentage of students meeting or exceeding their RIT point growth target – mathematics

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	13.2%	17.8%	15.8%	17.4%	17.4%	18.8%	17.3%	16.4%
5	23.4%	25.0%	26.4%	27.7%	29.4%	27.9%	25.0%	26.9%
10	30.2%	31.7%	31.7%	34.2%	34.0%	32.0%	29.9%	30.6%
20	36.7%	38.3%	38.7%	42.4%	41.0%	37.3%	35.8%	37.9%
30	41.6%	43.6%	43.2%	47.8%	46.0%	40.6%	38.9%	42.6%
40	45.8%	47.8%	47.7%	53.1%	50.0%	44.4%	42.0%	47.6%
50	50.0%	51.9%	51.7%	57.7%	53.6%	47.6%	45.5%	51.4%
60	54.3%	55.8%	55.6%	61.9%	56.9%	51.3%	49.1%	54.8%
70	59.3%	60.0%	59.5%	66.7%	60.4%	54.1%	56.8%	57.5%
80	65.3%	65.1%	64.0%	72.3%	64.1%	58.5%	60.6%	61.0%
90	71.8%	72.0%	70.8%	80.0%	70.5%	64.1%	71.0%	69.9%
95	78.3%	77.0%	75.2%	85.7%	74.3%	69.5%	73.3%	80.9%
99	87.1%	83.7%	83.6%	94.7%	84.7%	81.5%	83.9%	92.6%
Summary Information								
Count	947	1297	1309	960	557	487	279	130
Mean	50.56%	51.63%	51.28%	57.19%	52.78%	47.97%	47.90%	50.98%
SD	16.33%	15.32%	14.87%	17.28%	13.76%	12.70%	15.15%	15.17%

Table 19 – School percentile ranks for fall to fall percentage of students meeting or exceeding their RIT point growth target – mathematics

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	22.3%	19.6%	22.6%	19.4%	23.2%	26.1%	24.1%	20.6%
5	30.8%	30.2%	32.0%	28.6%	30.9%	34.7%	31.7%	30.5%
10	37.8%	36.2%	37.2%	36.4%	36.4%	39.2%	37.2%	34.6%
20	44.3%	43.1%	43.3%	43.6%	42.5%	44.6%	43.3%	40.4%
30	48.3%	47.4%	47.5%	48.0%	47.1%	47.8%	47.6%	44.6%
40	51.9%	51.7%	50.6%	52.6%	50.3%	50.9%	50.3%	48.1%
50	56.1%	55.1%	54.2%	56.5%	52.9%	53.6%	53.6%	50.8%
60	59.7%	58.4%	57.1%	59.5%	56.2%	56.5%	57.3%	53.5%
70	63.8%	62.1%	60.7%	63.0%	59.2%	59.6%	61.9%	58.4%
80	68.2%	66.0%	64.3%	67.5%	64.2%	62.5%	66.7%	63.6%
90	73.5%	71.3%	69.3%	73.3%	69.4%	68.2%	70.4%	69.4%
95	79.7%	75.0%	74.0%	76.7%	73.1%	72.3%	73.9%	73.3%
99	85.8%	82.2%	81.5%	86.3%	80.7%	81.7%	81.7%	80.0%
Summary Information								
Count	879	1543	1485	942	647	614	395	278
Mean	55.82%	54.28%	53.68%	55.27%	53.01%	53.65%	54.00%	51.44%
SD	14.14%	13.65%	12.60%	14.46%	12.65%	11.49%	12.94%	13.21%

Discussion

The primary purpose of the study was to offer some interpretation parameters to schools using the growth index statistic. The accompanying tables should be helpful to schools that use growth index information to evaluate programs and establish targets for improvement.

The data also tell us something about the differences between high and low growth programs. Table 20 and Figures 1 through 3 show the growth index range of difference between the top 10%, median, and bottom 10% of schools.

Students in the lowest 10% of schools in a grade lose an average of about 2 to 3 RIT points per year relative to the **median** growth school. In addition, students in the lowest 10% of schools lose between about 4 and 8 RIT points relative to the **best** 10% of schools. While very few schools perform in the bottom 10% in more than one grade and subject, it is quite apparent that students in a school producing consistently below average results would lose considerable ground against their peers.

This data can be helpful for schools that want to set improvement targets using the growth index figures. As a general rule growth index improvements of 2 to 3 points will move a school up about 40 percentile ranks. It is also important to note that the difference between the lower 10% and median are not dramatically greater in the early grades than they are in the middle grades. For example the difference between the 10th and 50th percentile growth index score in reading is 2.9 points in grade 3.2 and 2.4 points in grade 8. While overall reading growth may be greater with younger children, one could conclude from this data that the capacity for improvement is fairly similar. That is a poor performing middle school that raises its performance to the median will have gained nearly as much for its students as a poor performing elementary school that accomplished the same.

We should also keep in mind that, even in the best schools, many children do not succeed in achieving their growth index target. In the top 10% of schools about 60 to 70% of the students reach their RIT point growth norm target in reading, while about 65 to 75% of students meet this target in mathematics. When setting targets using this statistic, educators should remember that a school in which more than 70% of the students meet or exceed their growth index norm is exemplary.

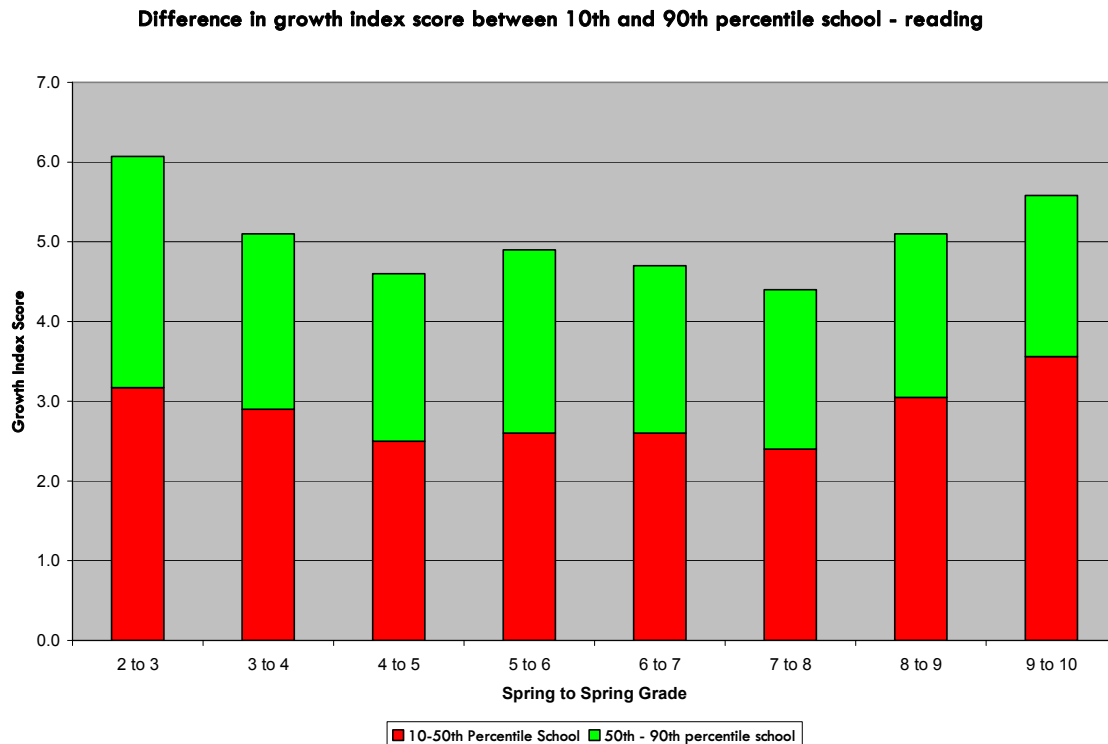
Above all else, the study reinforces the need for schools to have growth data that provides a substantive basis for comparisons when making decisions about effectiveness and setting targets for improvement. Schools have not typically had access to this kind of information. This means that schools normally set improvement targets without empirical data to guide the decision. The resulting targets are often shots in the dark, sometimes so easy as to be achieved without effort, at other times so difficult that they guarantee failure. Empirical data can improve this process and the quality of school improvement targets.

We hope that reviewing the evidence of what NWEA schools have achieved relative to value-added growth will help districts make more informed and reliable judgments about the effectiveness of their schools and set more refined targets for improvement.

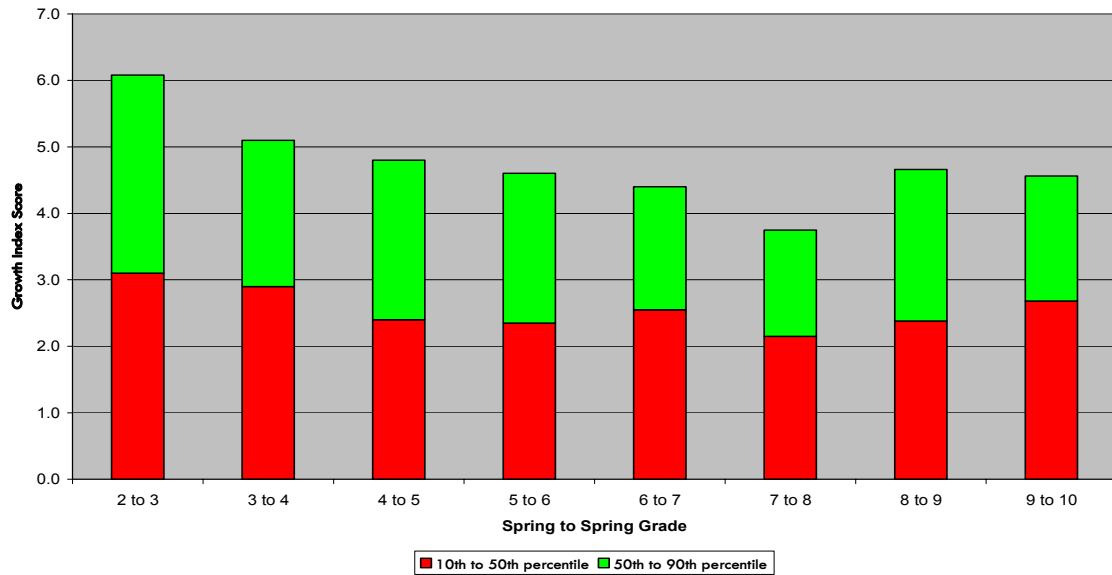
Table 20 – Spring to spring range of school-wide growth index scores

		Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
Reading	10 th -50 th percentile	3.2	2.9	2.5	2.6	2.6	2.4	3.1	3.6
	50 th – 90 th percentile	2.9	2.2	2.1	2.3	2.1	2.0	2.1	2.0
	10 th – 90 th percentile	6.1	5.1	4.6	4.9	4.7	4.4	5.1	5.6
Language Usage	10 th -50 th percentile	3.1	2.9	2.4	2.4	2.6	2.2	2.4	2.7
	50 th – 90 th percentile	3.0	2.2	2.4	2.3	1.9	1.6	2.3	1.9
	10 th – 90 th percentile	6.1	5.1	4.8	4.6	4.4	3.8	4.7	4.6
Mathematics	10 th -50 th percentile	3.6	3.4	3.2	3.9	3.4	2.8	3.2	4.0
	50 th – 90 th percentile	3.8	3.1	3.1	4.6	2.6	2.6	4.4	3.4
	10 th – 90 th percentile	7.4	6.5	6.3	8.5	6.0	5.4	7.6	7.3

Figures 1-3 – Range of spring to spring school-wide growth index scores in reading, language usage, and mathematics



**Difference in Growth Index Score between 10th and 90th percentile school -
language usage**



Difference in growth index score between the 10th and 90th percentile - mathematics

